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Fungicide-Insecticide Study on Soybeans

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Abstract
This study was designed to optimize insecticide and fungicide usage on soybeans by comparing different products applied at different timings. To explain yield responses, foliar disease severity and aphid populations were assessed throughout the season.

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Plant Pathology, Entomology, Agronomy

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Introduction

This study was designed to optimize insecticide and fungicide usage on soybeans by comparing different products applied at different timings. To explain yield responses, foliar disease severity and aphid populations were assessed throughout the season.

Materials and Methods

Plots were established on July 9, 2008. Plot size was four 30 in. rows by 35 ft long. The field was set up in a randomized block design with five replications.

Fungicides and insecticides were sprayed either alone or in combination at growth stage R1 or growth stage R3. Two controls were included. One was a non-treated control and the other was an IPM-based control that used the 250 aphid threshold to trigger an insecticide application (Table 1). The R1 sprays were on July 9 and the R3 sprays were on July 31, 2008.

Data were collected for foliar disease three times during the summer. The upper and lower canopies were assessed for percent coverage of foliar disease caused by fungal pathogens. Because of low disease pressure, only the last assessment (August 27, 2008) was included in Table 1. Aphids were assessed on all treatments regularly throughout the summer and are reported as Cumulative Aphid Days (CAD). Before harvest, stems from selected treatments were rated for anthracnose stem blight. Finally, grain yield (adjusted to 13% moisture), moisture, protein, and oil were recorded.

Results and Discussion

Aphid populations at the Sutherland farm were heavy and IPM control plots reached economic threshold by July 31, 2008 and were sprayed.

Preliminary results indicate that insect and disease pressure was greater in plots receiving R1 sprays compared with R3 sprays. In nearly every case an R1 treatment had more disease or aphid pressure than an R3 treatment (Table 1). This suggests that insect and disease pressure did not start until well after the R1 application, so these products were not able to manage the pests.

Yields reflect these results by showing similar differences between R1 and R3 sprays.

This project will continue for the next three growing seasons. We will continue to look at the interaction between insecticides and fungicides to optimize the use of these products on soybean.

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Table 1. Fungicides and insecticides applied at growth stages R1 and R3 and resultant disease and insect pressure and yield response.

Treatment	Application timing	Brown spot in lower canopy (%)	Cercospora leaf blight in upper canopy (%)	Anthracnose stem blight (%)	Cumulative aphid days (CAD)*	Protein (%)	Oil (%)	Moisture (%)	Yield (bu/A)
Stratego Pro	R1	4.20	6.62	1.44	55476	34.20	18.96	11.38	38.35[de]
Stratego Pro	R3	4.12	6.30	0.89	60877	34.06	19.07	11.06	40.21[cd]
Punch	R1	6.94	6.98	.	50316	34.10	19.00	11.16	37.12[de]
Punch	R3	6.58	5.18	.	47188	33.77	19.16	11.18	38.18[de]
Headline	R1	5.60	2.90	.	40140	33.90	19.12	11.21	37.40[de]
Headline	R3	3.58	4.98	.	31748	34.06	19.04	11.10	42.93[c]
Leverage	R1	6.36	4.76	.	52087	33.82	19.09	11.02	48.51[b]
Leverage	R3	5.32	1.30	3.40	17472	33.47	19.11	11.14	55.36[a]
Asana	R1	5.28	0.78	.	16436	33.70	19.02	11.14	48.61[b]
Asana	R3	5.06	0.76	.	12470	33.35	19.11	11.14	56.62[a]
Stratego Pro + Leverage	R1	3.26	1.84	2.28	23930	33.66	19.12	11.22	49.84[b]
Stratego Pro. + Leverage	R3	2.54	1.14	0.35	9062	33.45	19.08	11.46	57.68[a]
Punch + Asana	R1	7.60	2.12	.	23071	33.22	19.14	11.22	51.28[b]
Punch + Asana	R3	5.12	2.46	.	5271	33.49	19.09	11.08	56.39[a]
Control	--	7.40	8.22	5.40	92281	33.70	19.24	11.20	35.66[e]
IPM*	--	5.40	3.38	.	29331	33.31	19.01	11.08	56.75[a]

*Threshold of 250 aphids/plant; Asana was assigned as the IPM insecticide